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UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/915,024	07/25/2001	Raymond R. Husted	01AB067	7026

7590   07/21/2003

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EXAMINER
SONG, JASMINE

ART UNIT	PAPER NUMBER
2188	4

DATE MAILED: 07/21/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 07-01)

	Application No.	Applicant(s)
Office Action Summary	09/915,024	HUSTED ET AL.
	Examiner	Art Unit
	Jasmine Song	2188

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _25 July 2001_ .

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-19_ is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-19_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _25 July 2001_ is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

    If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

        1.☐ Certified copies of the priority documents have been received.

        2.☐ Certified copies of the priority documents have been received in Application No. _____ .

        3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

    a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)
2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3)☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _2_ .

4)☐ Interview Summary (PTO-413) Paper No(s). _____ .
5)☐ Notice of Informal Patent Application (PTO-152)
6)☐ Other: _____ .

Detailed Action

1.   Claims 1-19 are presented for Examination.

Specification

2.   The lengthy specification has not been checked to the extent necessary to

determine the presence of all possible minor errors. Applicant's cooperation is

requested in correcting any errors of which applicant may become aware in the

specification.

Claim Objections

3.   Claim 5 is objected to because of the following informalities:

In claim 5, line 1, "I/O processing" should be changed to – I/O processor--.

Appropriate correction is required.

Oath/Declaration

4.   The applicant's oath/declaration has been reviewed by the examiner and is found

to conform to the requirements prescribed in 37 C.F.R. § 1.63.

Information Disclosure Statement

5.   As required by M.P.E.P § 609 (C), the applicant's submission of the Information

Disclosure Statement, dated on August 25 of 2000, is acknowledged by the examiner;

and the cited references have been considered in the examination of the claims now

pending. As required by M.P.E.P § 609 C (2), a copy of the PTO-1449 initialed and

dated by the examiner is attached to the instant office action.

Drawings

6.   The drawings filed on 07/25/2001 have been approved by the Examiner.

Claim Rejections - 35 USC § 112

7.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 3 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite

for failing to particularly point out and distinctly claim the subject matter which applicant

regards as the invention.

8.   Claim 3 recites the limitation "the message" in lines 2. There is insufficient

antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

9.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10.   Claims 1-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Schmidt et al., U.S. Patent 5,212,631, in view of Sharma et al., U.S. Patent 6,085,263.

Regarding claims 1,6 and 9, Schmidt teaches that a programmable control

system, comprising:

a processor (Fig.2, General purpose processor 60) for executing a control

program (col.3, lines 63-66 and col.4, lines 33-34); a shared memory (Fig.2, shared

system RAM 36) storing data associated with the control program, at least one of data

associated with sensing and actuating devices (col.3, lines 63 –68; col.5, lines 58-62

and Fig.3, col.5, lines 32-39), and forced I/O values (Fig.3); and

an I/O processor (Fig.2 or Fig.4, the ladder logic processor 50) for performing at

least one of input and output functions (Fig.4), the I/O processor and the processor

operatively coupled to the shared memory (Fig.2). The I/O processor storing input

values in the shared memory and determining output value based at least in part upon

forced I/O values (utilizing the infrequently changed data) stored in the shared memory

(col.6, lines 50 to col.7, lines 39).

Schmidt does not teach that the I/O processor operatively coupled to a cache

memory storing at least a portion of the forced I/O values stored in the shared memory,

therefore, storing input values in the shared memory and determining output value

based at least in part upon forced I/O values stored in the cache memory.

However, Sharma teaches that the I/O processor operatively coupled to a cache

memory storing at least a portion of the forced I/O values stored in the shared memory

(as shown in Fig.1, IOP 800 includes the cache 820 storing the data prefetched from the

shared memory 150, therefore, storing and loading data from the shared memory is

based on the prefetched data within the cache memory) (col.14, lines 9-37).

It would have been obvious to the ordinary skill in the art at the time the invention was made to utilize the teachings of Sharma such as having a cache storing the portion of data from the shared memory because this feature improves overall performance of the system since the prefetched data is already in the cache memory and does not need to be retrieved from the slow shared memory.

According, one of ordinary skill in the art would have recognized this and concluded that they are from the same field of endeavor (for example: I/O processor includes the cache memory). This would have motivated one of ordinary skill in the art to implement the above combination for the advantages set forth above.

Regarding claims 10,12,15-17 and 19, Schmidt teaches that a method for forcing an I/O values in an industrial control environment, comprising:

receiving information associated with an input from a sensing device; retrieving information associated with an output to an actuating device (col.3, lines 63 –68; col.5, lines 58-62 and Fig.3, col.5, lines 32-39);

Schmidt does not teach that loading a cache with forcing information associated with a forced input or output and forcing the input or output based at least in part upon the forcing information loaded in the cache.

However, Sharma teaches that loading a cache with forcing information associated with a forced input or output and forcing the input or output based at least in part upon the forcing information loaded in the cache (as shown in Fig.1, IOP 800 includes the cache 820 storing the data prefetched from the shared memory 150,

therefore, storing and loading data from the shared memory is based on the prefetched data within the cache memory) (col.14, lines 9-37).

It would have been obvious to the ordinary skill in the art at the time the invention was made to utilize the teachings of Sharma such as having a cache storing the portion of data from the shared memory because this feature improves overall performance of the system since the prefetched data is already in the cache memory and does not need to be retrieved from the slow shared memory.

According, one of ordinary skill in the art would have recognized this and concluded that they are from the same field of endeavor (for example: I/O processor includes the cache memory). This would have motivated one of ordinary skill in the art to implement the above combination for the advantages set forth above.

Regarding claims 2-3,8,11,13-14 and 18, Sharma teaches that the processor sending a message to the I/O processor in the event a forced I/O value (the infrequently changed data) has been altered during execution of the control program, the I/O processor causing the cache memory to be refreshed by performing a blocked write in response to receipt of the message. It would have been obvious to the ordinary skill in the art at the time the invention was made to utilize the teachings of Sharma such as I/O processor perform a blocked write to refresh the cache memory in response to the altered I/O value caused by the processor in order to maintain the consistency among the caches of the IOP and processors (col.7, lines 10-39).

Regarding claim 4, Schmidt teaches that the forced I/O values comprising at

least one of binary and analog values (col.6, lines 19-21).

Regarding claim 5, Schmidt teaches that the processor and I/O processing being

coupled by at least one of a serial communications backplane bus, a parallel

communications backplane bus and a network (Fig.2, first and second network

interfaces and col.4, lines 1-4).

Regarding claim 7, Schmidt teaches that the infrequently changed data being at

least one of I/O force data, configuration data, I/O fail safe information, a connection

table, an output keep alive table and information associated with an input time-out

(Fig.3).

Conclusion

11.   The prior art made of record and not relied upon is considered pertinent to

applicant's disclosure.

Sartore., U.S. Patent 6223266 B1 teaches that a system and method for interfacing an

input/output system memory to a host computer system memory.

Kuwata, U.S. Patent 6349358 B1 teaches that a magnetic disk control apparatus detects a near

sequential I/O and pre-reads data from a magnetic disc drive into a cache memory.

Schmidt et al., U.S. Patent 5265005 teaches that a processor for a programmable controller.

Brooks et al., U.S. Patent 5295059 teaches that a programmable controller with ladder diagram macro instruction.

VanDoren et al., U.S. Patent 6279084 B1 teaches that shadow commands to optimize sequencing of requests in a switch-based multi-processor system.

Aoki et al., US 2001/0003187 A1 teaches that a task parallel processing method.

12. When responding to the office action, Applicant is advised to clearly point out the patentable novelty which he or she thinks the claims present in view of the state of the art disclosed by the references cited or the objections made. He or she must also show how the amendments avoid such references or objections. See 37 C.F.R. 1.111 (c).

13. When responding to the office action, Applicants are advised to provide the examiner with the line numbers and page numbers in the application and/or references cited to assist examiner to locate the appropriate paragraphs.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jasmine Song whose telephone number is 703-305-7701. The examiner can normally be reached on 8:00-4:30.
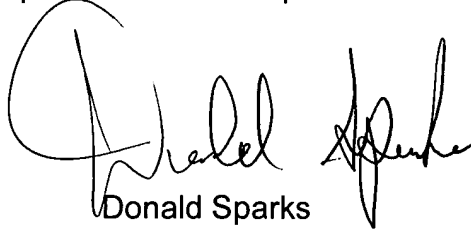
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Donald Sparks can be reached on 703-308-1756. The fax phone numbers for the organization where this application or proceeding is assigned are 703-746-7238 for regular communications and 703-746-7239 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or

proceeding should be directed to the receptionist whose telephone number is 703-305-

3900.

Jasmine Song

Patent Examiner

July 14, 2003

Donald Sparks

Supervisory Patent Examiner

Technology Center 2100